Litton BIONETICS

A 30

MUTAGENIC EVALUATION OF

COMPOUND 001407554

TANNIC ACID

(73-56)

5516 Nicholson Lane
Kensington, Maryland
20795

Mutagenic Evaluation of Compound FDA 73-56 **Tannic Acid** 3/21/75

A 30

LBI PROJECT #2468

MUTAGENIC EVALUATION OF

COMPOUND 001401554

TANNIC ACID

(73-56)

SUBMITTED TO

FOOD AND DRUG ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
ROCKVILLE, MARYLAND

SUBMITTED BY

LITTON BIONETICS, INC.
5516 NICHOLSON LANE
KENSINGTON, MARYLAND

March 21, 1975

Litton BIONETICS

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EVALUATION SUMMARY

Compound 001401554, Tannic Acid, did not exhibit genetic activity in any of the *in vitro* tests employed in this evaluation.

DATE: March 21, 1975

SPONSOR: Food and Drug Administration

SUBJECT: Evaluation of Test Compound 001401554 - Tannic Acid

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: July, 1974

2. Description: Light brown powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: *Saccharomyces cerevisiae* D4

Bacteria Strains: *Salmonella typhimurium*

TA-1535
TA-1537
TA-1536

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

Component	Final Concentration/ml	
1. TPN (sodium salt)	6	µM
2. Isocitric acid	49	µM
3. Tris buffer, pH 7.4	28	µM
4. $MgCl_2$	1.7	µM
5. Tissue homogenate fraction	72	mg

D. Tissue Homogenates and Supernatant

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mice, adult male random bred ICR strain; rats, adult male Sprague-Dawley; monkey, adult male rhesus (Macaca mulatta).

E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1

POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

Assay	Chemical[a]	Solvent	Probable Mutagenic Specificity
Non-activation	Ethylmethane sulfonate	Water or saline	BPS
	2-Nitrofluorene	Dimethylsulfoxide[c]	FS
	Quinacrine mustard	Water or saline	FS
Activation	Dimethylnitrosamine	Water or saline	BPS
	2-Acetylaminofluorene	Dimethylsulfoxide[c]	FS

[a] Concentrations given in the Results Section
[b] BPS = base-pair substitution; FS = frameshift
[c] Previously shown to be non-mutagenic

III. METHODS

A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose. Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.

B. Plate Tests

In the nonactivation procedure, approximately 10^9 cells of a log-phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (test, positive control and solvent control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

C. Suspension Tests

1. Non activation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of 1×10^9 cells/ml and 5×10^7 cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a 10^{-1} dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

2. Activation

Bacteria and yeast cells were grown and prepared as described in the non activation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for non activation tests.

D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. Data was then processed and printed from a computer program.

IV. RESULTS SECTION

A. Solubility Properties of the Test Compound

1. Name or code designation of the test compound:
001401554 -- Tannic Acid

2. Test solvent: Saline

3. Solubility of the test compound under treatment conditions:
This compound was soluble at all treatment concentrations.

4. Additional comments: None

B. Toxicity and Dosage Determinations for the Test Compound

1. Test date for toxicity determination: 9-15-74

2. The 50% survival level was determined for bacteria and yeast indicator organisms by conducting survival curves with the test compound at the following concentrations:

Percent Concentration (w/v or v/v)

10.0
1.0
0.1
0.01
0.001

3. Concentrations of the test compound used in the mutagenicity tests:

	Percent Concentration	
Dose	Bacteria	Yeast
1/4 50% Survival	0.075%	2.5%
1/2 50% Survival	0.015%	5.0%
50% Survival	0.03%	>5.0% (No Toxic Level)
Plate Tests	0.015%	--

C. Summary of Test Results

Plate Tests

1. Name or code designation of the test compound: 001401554

2. Test date: 10-15-74

3. Concentration of the test compound: 0.015%

Test	Species	Tissue	TA-1535		TA-1537		TA-1538	
Non-activation			1	2	1	2	1	2
Solvent Control	--	--	2	1	2	4	5	1
Positive Control[a]	--	--	>1,000	>1,000	>100	>100	>100	>100
Test Compound	--	--	1	1	3	3	5	1
Activation								
Negative Control	--	--	3	0	10	5	1	0
Solvent Control	--	--	1	1	12	10	6	7
Reaction Mixture Control	--	--	--	--	--	--	--	--
Positive Control[b]	Mouse	Liver	>1,000	>1,000	44	43	>100	>100
Positive Control		Lung	2	4	9	3	13	8
Positive Control		Testes	1	5	6	10	3	3
Positive Control	Rat	Liver	>100	>100	41	30	>100	>100
Positive Control		Lung	1	0	7	10	5	0
Positive Control		Testes	3	0	14	17	10	3
Positive Control	Monkey	Liver	>100	>100	32	46	>100	>100
Positive Control		Lung	0	4	20	13	2	4
Positive Control		Testes	1	1	10	11	3	7
Test Compound	Mouse	Liver	2	2	7	8	11	9
Test Compound		Lung	0	1	8	5	12	9
Test Compound		Testes	1	0	5	6	11	14
Test Compound	Rat	Liver	3	2	15	11	7	12
Test Compound		Lung	2	1	7	12	5	7
Test Compound		Testes	0	2	7	12	7	12
Test Compound	Monkey	Liver	2	2	7	11	13	6
Test Compound		Lung	1	1	8	6	4	8
Test Compound		Testes	0	0	4	9	4	5

[a] TA-1535 EMS 10 µl/plate
TA-1537 QM 20 µg/plate
TA-1538 NF 100 µg/plate

[b] TA-1535 DMNA 50 µm/plate
TA-1537 AAF 100 µg/plate
TA-1538 AAF 100 µg/plate

DATA TABLE TERMS AND ABBREVIATIONS

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
COMPOUND	Client designated compound number appears in this column.
TEST CODES	NAN = Non Activation: Solvent Control NAP = Non Activation: Positive Control NA1 = Non Activation: Test Compound Dose 1 NA2, etc. = Reflects the other dose level(s) A+C = Negative Chemical Control A-C = Activation: Solvent Control ACP = Activation: Positive Control ACT = Activation: Test Compound LI = Liver Tissue Activation Fraction LU = Lung Tissue Activation Fraction KI = Kidney Tissue Activation Fraction TE = Testes Tissue Activation Fraction 1,2, etc. = Dose Levels
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units. Example: 0025-2PCT = 0.25 percent concentration
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = X 10^6).
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = X 10^0). For strain D4, MUT 1 represents the number of ADE+ convertants.
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.
CONTAM	Presence of contamination on any plates.

DATA TABLE TERMS AND ABBREVIATIONS (continued)

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDAW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey (Macaca mulatta)
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 03/20/75

SPECIES COMPOUND 0013401554

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	000004 ADF EX-5	000004 TRY EX-5
NAN		1.46	11.81	10.61	6.55	4.37
NAP		1104.27	115.80	48.98	89.60	101.00
NA1		1.17	5.12	14.89	5.56	6.06
NA2		1.14	13.02	9.90	5.06	7.74

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXP34

COMPOUND FREQUENCY SUMMARY REPORT 03/20/75

SPECIES ICRFLO COMPOUND 001401554

TEST	ORG	TA1535 HIS EX-R	TA1537 HIS EX-R	TA1538 HIS EX-R	000004 ADF EX-5	000004 TRY EX-5
ACT	A+C	2.22	8.49	7.07	6.16	3.54
ACT	A-C	2.42	6.62	5.82	5.54	4.62
ACT	PLI	731.67	15.10	29.84	8.20	8.83
ACT	PLP	6.59	4.95	7.11	6.09	4.57
ACT	PTF	5.62	2.17	8.59	3.65	5.41
ACT	LI1	0.95	8.78	3.41	4.65	2.03
ACT	LI2	1.57	7.77	8.32	5.17	2.17
ACT	LP1	0.95	6.61	3.62	3.44	3.44
ACT	LP2	1.73	4.11	10.03	5.90	3.42
ACT	TF1	1.66	4.89	8.05	3.20	0.56
ACT	TF2	2.65	7.14	3.31	3.46	4.81

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 03/20/75

SPECIES SPRDAW COMPOUND 001401554

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	3.33	17.09	3.88	2.71	2.50
ACT	A-C	2.67	7.52	9.55	3.40	2.91
ACT	PLT	245.66	29.39	42.79	9.42	10.27
ACT	PLH	0.97	10.17	5.90	3.91	3.55
ACT	PTF	1.68	8.83	6.08	0.22	2.02
ACT	LI1	2.35	17.72	11.07	0.00	2.14
ACT	LI2	1.33	16.98	7.10	1.40	3.33
ACT	LH1	2.44	16.59	7.14	0.14	1.36
ACT	LH2	2.60	16.40	13.88	1.59	1.59
ACT	TF1	2.71	14.67	4.55	1.62	1.03
ACT	TF2	2.76	15.41	6.01	1.87	4.24

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 03/20/75

SPECIES RHESUS COMPOUND 001401554

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	4.27	18.27	9.18	4.06	1.43
ACT	A-C	2.49	16.19	13.85	2.86	1.33
ACT	PLI	206.49	26.72	30.32	9.81	2.82
ACT	PLII	2.49	8.64	13.79	3.94	3.62
ACT	PTF	2.79	6.91	8.71	7.10	3.84
ACT	LI1	2.55	12.22	9.57	2.05	3.41
ACT	LI2	4.85	15.26	9.79	6.25	3.39
ACT	LII1	1.99	5.17	13.79	2.97	2.37
ACT	LII2	5.43	12.07	16.61	4.72	3.64
ACT	TE1	2.25	10.42	18.75	1.30	3.26
ACT	TE2	******	16.74	5.75	6.40	5.48

V. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound 001401554, Tannic Acid, was evaluated for genetic activity in a series of *in vitro* microbial assays with and without metabolic activation.

A. *Salmonella typhimurium*

1. Plate Tests

At a concentration of 0.015%, this compound was not mutagenic in the bacterial plate tests with or without activation.

2. Non-activation Suspension Tests

These tests were all negative.

3. Activation Suspension Tests

These tests were all negative.

B. *Saccharomyces cerevisiae*

1. Non-activation Suspension Tests

These tests were all negative.

2. Activation Suspension Tests

These tests were all negative.

C. Conclusions

Compound 001401554, Tannic Acid, was not genetically active for bacteria and yeast indicator organisms under the conditions of this evaluation.

Submitted by:

David Brusick, Ph.D.
Director
Department of Genetics

APPENDIX

Tabulation of Data

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428201 DETECTOR TA1535 SPECIES DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0547	0008	1.46	0
	NAP		EMS 0.002 %	0633	6990	1104.27	0
001401554	NA1		0008-3 PCT.	0768	0009	1.17	0
001401554	NA2		0015-4 PCT.	0689	0008	1.16	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428202 DETECTOR TA1537 SPECIES DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0432	0051	11.81	0
	NAP		DM 1.0 UG/ML	0405	0469	115.80	0
001401554	NA1		0008-3 PCT.	0683	0035	5.12	0
001401554	NA2		0015-4 PCT.	0361	0047	13.02	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM

COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 428203 DETECTOR TA1538 SPECIES DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ EP-8	CONTAM
	NAN		DMSO	0509	0054	10.61	0
	NAP		NF 125 UG-ML	0492	0241	48.98	0
001401554	NA1		0015-3 PCT.	0376	0056	14.89	0
001401554	NA2		0008-3 PCT.	0485	0048	9.90	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428204 DETECTOR 000004 SPECIES DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	NAM		SALINE	0962	0063	0042	6.55	4.37	0
	NAP		EMS 1.0 %	0798	0715	0806	89.60	101.00	0
001401554	NA1		0025-1 PCT.	0792	0044	0048	5.56	6.06	2
001401554	NA2		0125-2 PCT.	0672	0034	0052	5.06	7.74	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428401 DETECTOR TA1535 SPECIES SPRDAM DATE - 03/20/79

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0931	0031	3.33	0
	A-C		SALINE	1122	0030	2.67	0
	ACP	LI	DMN 50 UM/ML	0806	1980	245.66	0
	ACP	LO	DMN 50 UM/ML	1541	0015	0.97	0
	ACP	TE	DMN 50 UM/ML	0772	0013	1.68	0
001401554	ACT	LI1	0015-3 PCT.	1108	0026	2.35	0
001401554	ACT	LI2	0008-3 PCT.	0753	0010	1.33	0
001401554	ACT	LO1	0015-3 PCT.	0944	0023	2.44	0
001401554	ACT	LO2	0008-3 PCT.	0884	0023	2.60	0
001401554	ACT	TE1	0015-3 PCT.	0959	0026	2.71	0
001401554	ACT	TE2	0008-3 PCT.	1125	0031	2.76	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 430401 DETECTOR TA1537 SPECIES SPRDAW DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0234	0040	17.09	0
	A-C		DMSO	0399	0030	7.52	0
	ACP	LI	AAF 800 UG/ML	0313	0092	29.39	0
	ACP	LU	AAF 800 UG/ML	0531	0054	10.17	0
	ACP	TE	AAF 800 UG/ML	0283	0025	8.83	0
001401554	ACT	LI1	0015-3 PCT.	0474	0084	17.72	0
001401554	ACT	LI2	0008-3 PCT.	0483	0082	16.98	0
001401554	ACT	LU1	0015-3 PCT.	0434	0072	16.59	0
001401554	ACT	LU2	0008-3 PCT.	0616	0101	16.40	0
001401554	ACT	TE1	0015-3 PCT.	0409	0060	14.67	2
001401554	ACT	TE2	0008-3 PCT.	0305	0047	15.41	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 429601 DETECTOR TA1538 SPECIES SPRDAW DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQI EP-8	CONTAM
	A+C		AAF 800 UG/ML	0902	0035	3.88	0
	A-C		DMSO	0597	0057	9.55	0
	ACP	LI	AAF 800 UG/ML	0229	0098	42.79	0
	ACP	LU	AAF 800 UG/ML	0797	0047	5.90	0
	ACP	TE	AAF 800 UG/ML	0641	0039	6.08	0
001401554	ACT	LI1	0015-3 PCT.	0262	0029	11.07	0
001401554	ACT	LI2	0008-3 PCT.	0479	0034	7.10	0
001401554	ACT	LU1	0015-3 PCT.	0686	0049	7.14	0
001401554	ACT	LU2	0008-3 PCT.	0281	0039	13.88	0
001401554	ACT	TE1	0015-3 PCT.	0550	0025	4.55	0
001401554	ACT	TE2	0008-3 PCT.	0383	0023	6.01	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 429802 DETECTOR 000004 SPECIES SPRDAW DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0961	0026	0024	2.71	2.50	0
	A-C		SALINE	1235	0042	0036	3.40	2.91	0
	ACP	LI	DMN 90 UM/ML	0584	0055	0060	9.42	10.27	0
	ACP	LU	DMN 90 UM/ML	0818	0032	0029	3.91	3.55	0
	ACP	TE	DMN 90 UM/ML	0445	0001	0009	0.22	2.02	0
001401554	ACT	LI1	0025-1 PCT.	0514	0000	0011	0.00	2.14	0
001401554	ACT	LI2	0125-2 PCT.	0571	0008	0019	1.40	3.33	0
001401554	ACT	LU1	0025-1 PCT.	0734	0001	0010	0.14	1.36	0
001401554	ACT	LU2	0125-2 PCT.	0693	0011	0011	1.59	1.59	0
001401554	ACT	TE1	0025-1 PCT.	0677	0011	0007	1.62	1.03	0
001401554	ACT	TE2	0125-2 PCT.	0589	0011	0025	1.87	4.24	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428001 DETECTOR TA1535 SPECIES ICRFLO DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0541	0012	2.22	0
	A-C		SALINE	0454	0011	2.42	0
	ACP	LI	DMN 50 UM/ML	0300	2195	731.67	0
	ACP	LU	DMN 50 UM/ML	0167	0011	6.59	0
	ACP	TE	DMN 50 UM/ML	0178	0010	5.62	0
001401554	ACT	LI1	0015-3 PCT.	0317	0003	0.95	2
001401554	ACT	LI2	0008-3 PCT.	0447	0007	1.57	0
001401554	ACT	LU1	0015-3 PCT.	0420	0004	0.95	0
001401554	ACT	LU2	0008-3 PCT.	0346	0006	1.73	0
001401554	ACT	TE1	0015-3 PCT.	0541	0009	1.66	0
001401554	ACT	TE2	0008-3 PCT.	0302	0008	2.65	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428101 DETECTOR TA1537 SPECIES ICRFLO DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 FP-8	CONTAM
	A+C		AAF 800 UG/ML	0424	0036	8.49	0
	A-C		DMSO	0574	0038	6.62	0
	ACP	LI	AAF 800 UG/ML	0563	0085	15.10	0
	ACP	LU	AAF 800 UG/ML	0586	0029	4.95	0
	ACP	TE	AAF 800 UG/ML	0553	0012	2.17	0
001401554	ACT	LI1	0015-3 PCT.	0581	0051	8.78	0
001401554	ACT	LI2	0008-3 PCT.	0386	0030	7.77	0
001401554	ACT	LU1	0015-3 PCT.	0348	0023	6.61	0
001401554	ACT	LU2	0008-3 PCT.	1096	0045	4.11	0
001401554	ACT	TE1	0015-3 PCT.	0756	0037	4.89	0
001401554	ACT	TE2	0008-3 PCT.	1107	0079	7.14	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 428205 DETECTOR TA1538 SPECIES ICRFLO DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0679	0048	7.07	0
	A-C		DMSO	0790	0046	5.82	0
	ACP	LI	AAF 800 UG/ML	0858	0256	29.84	0
	ACP	LU	AAF 800 UG/ML	0774	0055	7.11	0
	ACP	TE	AAF 800 UG/ML	0617	0053	8.59	0
001401554	ACT	LI1	0015-3 PCT.	1406	0048	3.41	0
001401554	ACT	LI2	0008-3 PCT.	0517	0043	8.32	0
001401554	ACT	LU1	0015-3 PCT.	1824	0066	3.62	0
001401554	ACT	LU2	0008-3 PCT.	0578	0058	10.03	0
001401554	ACT	TE1	0015-3 PCT.	0671	0054	8.05	0
001401554	ACT	TE2	0008-3 PCT.	1238	0041	3.31	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 433001 DETECTOR 000004 SPECIES ICRFLO DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0876	0054	0031	6.16	3.54	0
	A-C		SALINE	0866	0048	0040	5.54	4.62	0
	ACP	LI	DMN 90 UM/ML	0793	0065	0070	8.20	8.83	0
	ACP	LU	DMN 90 UM/ML	0722	0044	0033	6.09	4.57	0
	ACP	TE	DMN 90 UM/ML	0739	0027	0040	3.65	5.41	0
001401554	ACT	LI1	0025-1 PCT.	0344	0016	0007	4.65	2.03	0
001401554	ACT	LI2	0125-2 PCT.	0600	0031	0013	5.17	2.17	0
001401554	ACT	LU1	0025-1 PCT.	0553	0019	0019	3.44	3.44	2
001401554	ACT	LU2	0125-2 PCT.	0644	0038	0022	5.90	3.42	0
001401554	ACT	TF1	0025-1 PCT.	0531	0017	0003	3.20	0.56	0
001401554	ACT	TF2	0125-2 PCT.	0665	0023	0032	3.46	4.81	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM

COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 429801 DETECTOR TA1535 SPECIES RHESUS DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0585	0025	4.27	0
	A-C		SALINE	0883	0022	2.49	0
	ACP	LI	DMN 50 UM/ML	0524	1082	206.49	0
	ACP	LU	DMN 50 UM/ML	0683	0017	2.49	0
	ACP	TE	DMN 50 UM/ML	0466	0013	2.79	0
001401554	ACT	LI1	0015-3 PCT.	0588	0015	2.55	0
001401554	ACT	LI2	0008-3 PCT.	0433	0021	4.85	0
001401554	ACT	LU1	0015-3 PCT.	0705	0014	1.99	0
001401554	ACT	LU2	0008-3 PCT.	0442	0024	5.43	0
001401554	ACT	TE1	0015-3 PCT.	0534	0012	2.25	0
001401554	ACT	TE2	0008-3 PCT.	0000	0016	******	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM

COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468

EXPERIMENT 429701 DETECTOR TA1537 SPECIES RHESUS DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0416	0076	18.27	0
	A-C		DMSO	0420	0068	16.19	0
	ACP	LI	AAF 800 UG/ML	0378	0101	26.72	0
	ACP	LU	AAF 800 UG/ML	0880	0076	8.64	0
	ACP	TF	AAF 800 UG/ML	0868	0060	6.91	0
001401554	ACT	LI1	0015-3 PCT.	0769	0094	12.22	0
001401554	ACT	LI2	0008-3 PCT.	0498	0076	15.26	0
001401554	ACT	LU1	0015-3 PCT.	1239	0064	5.17	0
001401554	ACT	LU2	0008-3 PCT.	0522	0063	12.07	0
001401554	ACT	TF1	0015-3 PCT.	0758	0079	10.42	0
001401554	ACT	TF2	0008-3 PCT.	0478	0080	16.74	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 430301 DETECTOR TA153R SPECIES RHESUS DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPH EP+6	MUTI EP+0	FREQI EP-8	CONTAM
	A+C		AAF 800 UG/ML	0294	0027	9.18	0
	A-C		DMSO	0325	0045	13.85	0
	ACP	LI	AAF 800 UG/ML	0221	0067	30.32	0
	ACP	LU	AAF 800 UG/ML	0203	0028	13.79	0
	ACP	TE	AAF 800 UG/ML	0264	0023	8.71	0
001401554	ACT	LT1	0015-3 PCT.	0345	0033	9.57	0
001401554	ACT	LT2	0008-3 PCT.	0419	0041	9.79	0
001401554	ACT	LU1	0015-3 PCT.	0319	0044	13.79	0
001401554	ACT	LU2	0008-3 PCT.	0277	0046	16.61	0
001401554	ACT	TE1	0015-3 PCT.	0256	0048	18.75	0
001401554	ACT	TE2	0008-3 PCT.	0487	0028	5.75	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431101 DETECTOR 0000D4 SPECIES RHESUS DATE - 03/20/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0912	0037	0013	4.06	1.43	0
	A-C		SALINE	0979	0028	0013	2.86	1.33	0
	ACP	LI	DMN 90 UM/ML	0744	0073	0021	9.81	2.82	0
	ACP	LU	DMN 90 UM/ML	0939	0037	0034	3.94	3.62	0
	ACP	TE	DMN 90 UM/ML	0704	0050	0027	7.10	3.84	0
001401554	ACT	LI1	0025-1 PCT.	0733	0015	0025	2.05	3.41	0
001401554	ACT	LI2	0125-2 PCT.	0560	0035	0019	6.25	3.39	0
001401554	ACT	LU1	0025-1 PCT.	0843	0025	0020	2.97	2.37	0
001401554	ACT	LU2	0125-2 PCT.	0742	0035	0027	4.72	3.64	0
001401554	ACT	TE1	0025-1 PCT.	0768	0010	0025	1.30	3.26	0
001401554	ACT	TE2	0125-2 PCT.	0547	0035	0030	6.40	5.48	0